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Investigation of the cation distribution in perovskite-like oxides with mössbauer spectroscopy

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Abstract

Complex perovskite-like oxides, such as LnFe(2/3)Mo(1/3)O"3 orthoferrites, Ln(8 -) ySryCu(8 -) xFexO"2"0 (8-8-20), Pr"4BaCu"4FeO(13 - δ) (4-1-5), YBa(2 -) yLayCu(3 -) xFexO(7 - δ), and Y(1 -) yCayBa(2 -) yLayCu(3 -) xFexO(7 - δ) (1-2-3), are studied by means of Mössbauer spectroscopy. At room temperature, the spectra of the orthoferrites contain only magnetic components. The spectra of the 1-2-3 compounds contain only magnetically disordered components: iron atoms substitute for copper at Cu(1) sites, taking various configurations: planar squares, quadratic pyramids, and octahedra. Cuprates 8-8-20 and 4-1-5 have a wide diversity of spectra. In the 8---20 oxides, a phase related to the pyramidal environment of the iron cations is present at any iron concentration. In all the perovskites, iron cations become magnetically ordered only at octahedral sites of the structure. © 2005 Pleiades Publishing, Inc.

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